

REMARKS

Entry of the foregoing and reconsideration of the subject application are respectfully requested in light of the amendments above and the comments which follow.

As correctly noted in the Office Action Summary, claims 1-4, 6, 8-29 and 66-74 were pending. By the present response, claims 1, 9, 13, 17, 23-25, 27-29, 66, 71, and 73-74 have been amended, claims 2-4, 6, 8, 11-12, 15-16, 19-20, and 67-69 canceled, and claims 75-97 added. Thus, upon entry of the present response, claims 1, 9-10, 13-14, 17-18, 21-29, 66 and 70-97 remain pending and await further consideration on the merits.

Support for the foregoing amendments can be found, for example, in at least the following locations in the original disclosure: the original claims and the specification, page 14, lines 19 et seq., page 15, lines 8-9 and page 16, lines 10 et seq.

CLAIM OBJECTIONS

Claim 13 was objected to for the reasons presented in paragraph 3 of the Official Action. By the present response, claim 13 has been amended to include the missing punctuation noted by the Examiner. Withdrawal of the objection is respectfully requested.

CLAIM REJECTIONS UNDER 35 U.S.C. §103

The rejection of applicants' claims as outlined in paragraphs 5-8 of the Official Action are improper as an obviousness rejection because each of the rejections has

failed to establish a *prima facie* case of obviousness. As outlined in M.P.E.P. §§2143-2143.03, there are three basic criteria to establish a *prima facie* case of obviousness. First, there must be a suggestion or motivation to modify the reference or to combine the teachings. Second, there must be a reasonable expectation of success for the proposed modification or combination. Third, the references must teach or suggest all of the claim limitations. For each of the rejections outlined in the Official Action, at least one of the above three criteria is absent. Accordingly, the rejections are improper and should be withdrawn. Each rejection is discussed below.

Claims 1-4, 6, 12, 14-25, 27-29, 66-71, 73 and 74 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,342,755 to Russ et al. (hereafter "*Russ et al.*") on the grounds set forth in paragraph 5 of the Official Action.

The rejection of claims 2-4, 6, 12, 15-16, 19-20 and 67-69 is moot in view of the canceling of those claims.

Independent claim 1 recites that the claimed method comprises, *inter alia*, forming a suspension containing at least the carbon nanotubes and an adhesion promoting material in a liquid medium and co-depositing carbon nanotubes and the adhesion promoting material on a substrate to form the composite layer, the composite layer having an intimate mix of the carbon nanotubes and the adhesion-promoting material

Russ et al. discloses mixing insulating particles with emitting particles (col. 2, lines 12-13). Other components of the deposition bath include alcohol, a charging salt, water and a dispersant (col. 2, lines 43-44).

Comparing the disclosure in Russ et al. to the claims, there is no discussion in Russ et al. as to inclusion of an adhesion promoting material in the suspension and co-depositing the adhesion promoting material with the pre-formed nanostructure-containing material to form a composite layer. Rather (and as noted in the Official Action on page 5), Russ et al. discloses at best the inclusion of a conductive layer such as chromium (col. 3 line 6 – col. 4, line 2) that is already established on the substrate when the emitting particles are deposited. Thus, there is no explicit disclosure as to adhesion promoting material in the suspension and to codeposition.

Further, there is no suggestion or teaching to modify the disclosure in Russ et al. to include such a feature. Indeed, *Russ et al.* is explicit in reciting the contents of the suspension (see, col. 2, lines 43-44). Moreover, *Russ et al.* teaches that it is the water content of the deposition bath that affects the adhesion of the deposited emitting particles (see, col. 5, lines 5-8). Thus, in contrast to the claims, *Russ et al.* promotes adhesion by regulating the water content and not by inclusion of a separate adhesion promoting material.

Finally, independent claim 1 recites that the composite film has an intimate mix of the carbon nanotubes and the adhesion-promoting particle and independent claim 74 recites that the composite layer has an intimate mix of the carbon nanotubes and the adhesion-promoting material. No such disclosure is present in the cited documents. Rather, *Russ et al.* discloses a deposition of particles 18 of electron emitting material and or insulating particles 19 (see, e.g., Fig. 1a). There is no disclosure of adhesion-promoting material and carbon nanotubes in an intimate mix.

From the above, it is respectfully asserted that Russ et al. does not disclose, teach or suggest all of the features of claim 1 (see M.P.E.P. §§2143-2143.03). Accordingly, for at least the above reason withdrawal of the rejection is respectfully requested.

The remaining dependent claims distinguish over the Russ et al. reference for at least the same reasons as noted above and withdrawal of the rejection of these claims is also respectfully requested.

Further, the rejection of dependent claim 29 is respectfully traversed because Russ et al. discloses the use of chromium as a conductive material and not as an adhesion promoting material as claimed. In addition, claim 29 no longer recites the use of chromium, but rather the use of iron and titanium. There is no disclosure, teaching or suggestion in Russ et al. for the use of these recited materials as adhesion promoting materials as claimed. For at least these reasons, the rejection of claim 29 should be withdrawn.

Further, the rejection of dependent claim 66 and the further dependent claims 70-73 is respectfully traversed because Russ et al., at least in Fig. 1a referred to by the Examiner, does not disclose deposition over a mask to form a pattern of the composite layer as claimed.

Rather, Russ et al. merely shows areas of conductive material 14 on a substrate 12. There is no disclosure of masking and/or removing masking in the Russ et al. disclosure. Russ et al. appears to disclose that deposition is directly onto the conductive material 14 when it is disclosed that the cathode support 16 is a patterned ITO glass plate (col. 5, lines 54-55).

For at least these reasons, the rejection of dependent claim 66 and the further dependent claims 70-73 should be withdrawn.

Claim 13 stands rejected under 35 U.S.C. §103(a) as being unpatentable over *Russ et al.* as applied to claims 1-4, 6, 12, 14-25, 27-29, 66-71, 73 and 74 above, and further in view of U.S. Patent No. 6,616,497 to Choi et al. (hereafter "*Choi et al.*") or U.S. Patent No. 6,258,237 to Gal-Or et al. (hereafter "*Gal-Or et al.*") on the grounds set forth in paragraph 6 of the Official Action. The disclosure in *Choi et al.* or *Gal-Or et al.* do not contribute to overcome the deficiencies noted above in the disclosure in *Russ et al.* Therefore, the rejection of this claim is an improper obviousness rejection for at least the same reasons as noted above. Therefore, withdrawal of the rejection is respectfully requested.

Claims 26 and 72 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Russ et al.* as applied to claims 1-4, 6, 12, 14-25, 27-29, 66-71, 73 and 74 above, and further in view of U.S. Patent No. 5,296,117 to De Jaeger et al. (hereafter "*De Jaeger et al.*") on the grounds set forth in paragraph 7 of the Official Action. The disclosure in *De Jaeger et al.* does not contribute to overcome the deficiencies noted above in the disclosure in *Russ et al.* Therefore, the rejection of these claims is an improper obviousness rejection for at least the same reasons as noted above. Therefore, withdrawal of the rejection is respectfully requested.

Claims 8-11 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Russ et al.* as applied to claims 1-4, 6, 12, 14-25, 27-29, 66-71, 73 and 74

above, and further in view of U.S. Patent No. 6,824,755 to Colbert et al. (hereafter "*Colbert et al.*") on the grounds set forth in paragraph 8 of the Official Action.

The rejection of claims 8 and 11 is moot in view of the canceling of those claims.

With regard to the rejection of claims 9-10, it is respectfully noted that the disclosure in *Colbert et al.* does not contribute to overcome the deficiencies noted above in the disclosure in *Russ et al.* Therefore, the rejection of these claims is an improper obviousness rejection for at least the same reasons as noted above.

Therefore, withdrawal of the rejection is respectfully requested.

Furthermore, reviewing the proposed combination in the Official Action, applicants note that there is no motivation to combine the disclosure in *Ross et al.* or *Colbert et al.* with respect to the method of shortening the nanostructure-containing material. *Ross et al.*, discloses that that it is beneficial to have dispersed, rather than uniform, particle size distributions to improve packing whereas *Colbert et al.* discloses that homogenous lengths are preferred. These two disclosures are in direct contradiction on this point and one would not be motivated to combine such disparate disclosures because the processing in one teaches away from the processing in the other, e.g., dispersed sizes teaches away from homogenous lengths. Thus, the proposed combination is improper because the references teach away from each other. For at least this reason the rejection should be withdrawn.

Furthermore, *Colbert et al.* discloses cutting the nanotubes, but there is no disclosure, teaching, or suggestion in this reference or the *Ross et al.* reference that reduced length nanotubes can be suspended and used for electrophoretic deposition. For at least this further reason the rejection should be withdrawn.

NEW CLAIMS

Claims 75-97 have been added, including independent claims 79, 86 and 96. Each of these independent claims and their associated dependent claims distinguish over the cited references for at least the same reasons as discussed above.

Furthermore, at least some of these independent claims and their associated dependent claims recite additional distinguishing features. For example, claim 96 discloses a sequential operation involving at least two baths for the electrophoretic deposition.

CONCLUSION

From the foregoing, further and favorable action in the form of a Notice of Allowance is earnestly solicited. Should the Examiner feel that any issues remain, it is requested that the undersigned be contacted so that any such issues may be adequately addressed and prosecution of the instant application expedited.

Respectfully submitted,

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